IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of : SALIAHOV, Oleg)
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Serial No.: 09/943,876) Group Art Unit: 2134
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For: "OPTICAL DISC AUTHENTICATION METHOD AND APPARATUS"

CHANGES TO THE CLAIMS TO BE MADE BY EXAMINER'S AMENDMENT

1. (Currently Amended) An optical disc authentication method for authenticating optical discs, each disc having a plurality of ways and a plurality of sectors in each way, the method comprising the steps of:

   (i) measuring the quantity of sectors in each of a defined quantity of ways to provide a disc fingerprint comprising way sector quantity values for an original disc and a target disc; and

   (ii) authenticating the target disc by:

      a) comparing the target disc fingerprint to the original disc fingerprint to determine a percentage of coinciding way sector quantity values; and

      b) classifying the target disc according to whether its determined percentage value is above or below a pre-defined percentage threshold value, wherein a target disc having a determined percentage value of greater than or equal to the threshold value is classified as an original disc, and a target disc having a determined percentage value of less than the threshold value is classified as an illegally copied disc.

Page 1 of 10

2. (Original) The method according to claim 1, the measuring step includes the steps of:

    (i)   determining optical disc drive characteristics;

    (ii) collecting sector reading time data; and

    (iii) processing the collected data to provide way sector quantity values.

3. (Original) The method according to claim 2, wherein the optical disc drive characteristics are determined by:

    (i)   determining cache buffer memory size of the disc drive; and

    (ii) determining reading speed reduction parameters of the disc drive.

4. (Original) The method according to claim 2, wherein the sector reading time data is collected by:

    (i)   filling the cache buffer with blank data; and

    (ii) collecting reading time data in a reading time array from a defined quantity and location of ways on a disc.

5. (Original) The method according to claim 2, wherein the collected data is processed by:

    (i)   filtering the data to compensate for reading errors;

    (ii) determining a common slope from the filtered data; and

    (iii) identifying slopes matching the determined common slope to ascertain individual ways for the measurement of way sector quantity values.

6. (Original) The method according to claim 1, wherein the original disc fingerprint is provided in the form of a CD-Key.

7. (Original) The method according to claim 4, wherein the defined location of ways is the outside edge of the trace to increase accuracy.

8. (Currently Amended) The method according to claim 7, wherein a file is added to product data, and the ~~file of sufficient size to ensure~~ disc fingerprinting is performed at the outside edge of the disc to increase accuracy.

9. (Original) The method according to claim 8, wherein the file is empty.

10. (Original) The method according to claim 1, wherein the pre-defined percentage threshold value is about 70.

11. (Original) The method according to claim 1, wherein the defined quantity of ways tested is at least about 50.

12. (Original) The method according to claim 1, wherein product data is encrypted.

13. (Original) The method according to claim 1, wherein a protective shell is added to product data that requests a correct CD-Key to unlock the shell for access to the product data.

14. (Original) The method according to claim 1, wherein one or more steps are performed remotely.

15. (Original) The method according to claim 1, wherein a recordable disc is used.

16. (Original) The method according to claim 15, wherein the recordable disc is blank to limit the process to disc fingerprinting, enabling adding of product data at a later time.

17. (Currently Amended)   An optical disc authentication apparatus__for__
__authenticating optical discs__, each disc having a plurality of ways and a
plurality of sectors in each way, the apparatus comprising:

    means for measuring the quantity of sectors in each of a defined quantity
of ways to provide a disc fingerprint comprising way sector quantity values
for an original disc and a target disc; and

    means for authenticating the target disc including:

        means for comparing the target disc fingerprint to the original disc
fingerprint to determine a percentage of coinciding way sector
quantity values; and

        means for classifying the target disc according to whether its
determined percentage value is above or below a pre-defined
percentage threshold value, wherein a target disc having a
determined percentage value of greater than or equal to the
threshold value is classified as an original disc, and a target disc
having a determined percentage value of less than the threshold
value is classified as an illegally copied disc.

18. (Original)   The apparatus according to claim 17, wherein the measuring
means includes:

    means for determining optical disc drive characteristics;

    means for collecting sector reading time data; and

    means for processing the collected data to provide way sector quantity
values.

19. (Original)   The apparatus according to claim 18, wherein the optical disc
drive characteristics are determined by:

    means for determining cache buffer memory size of the disc drive; and

    means for determining reading speed reduction parameters of the disc
drive.

20. (Original) The apparatus according to claim 18, wherein the sector reading time data is collected by:

means for filling the cache buffer with blank data; and

means for collecting reading time data in a reading time array from a defined quantity and location of ways on a disc.

21. (Original) The apparatus according to claim 18, wherein the collected data is processed by:

means for filtering the data to compensate for reading errors;
means for determining a common slope from the filtered data; and
means for identifying slopes matching the determined common slope to ascertain individual ways for the measurement of way sector quantity values.

22. (Original) The apparatus according to claim 17, wherein the original disc fingerprint is provided in the form of a CD-Key.

23. (Original) The apparatus according to claim 20, wherein the defined location of ways is the outside edge of the trace to increase accuracy.

24. (Currently Amended) The apparatus according to claim 23, wherein a file is added to product data, and the ~~file of sufficient size to ensure~~ disc fingerprinting is performed at the outside edge of the disc to increase accuracy.

25. (Original) The apparatus according to claim 24, wherein the file is empty.

26. (Original) The apparatus according to claim 17, wherein the pre-defined percentage threshold value is about 70.

27. (Original) The apparatus according to claim 17, wherein the determined quantity of ways tested is at least about 50.

28. (Original) The apparatus according to claim 17, wherein product data is encrypted.

29. (Original) The apparatus according to claim 17, wherein a protective shell is added to product data that requests a correct CD-Key to unlock the shell for access to the product data.

30. (Original) The apparatus according to claim 17, wherein one or more elements are performed remotely.

31. (Original) The apparatus according to claim 17, wherein a recordable disc is used.

32. (Original) The apparatus according to claim 31, wherein the recordable disc is blank to limit the process to disc fingerprinting, enabling adding of product data at a later time.

33. (Currently Amended) A storage medium readable by a computer, the storage medium having a computer program embodied thereon encoding a computer process to provide an optical disc authentication method for authenticating optical discs, each disc having a plurality of ways and a plurality of sectors in each way, the computer processstorage medium comprising:

 codea processing portion for measuring the quantity of sectors in each of a defined quantity of ways to provide a disc fingerprint comprising way sector quantity values for an original disc and a target disc; and

 codea processing portion for authenticating the target disc including:

  codea processing portion for comparing the target disc fingerprint to the original disc fingerprint to determine a percentage of coinciding way sector quantity values; and

  a processing portioncode for classifying the target disc according to whether its determined percentage value is above or below a pre-defined percentage threshold value, wherein a target disc having a determined percentage value of greater than or equal to the threshold value is classified as an original disc, and a target disc

Page 6 of 10

having a determined percentage value of less than the threshold
value is classified as an illegally copied disc.

34. (Currently Amended) The ~~method~~storage medium according to claim 33,
wherein the code for measuring the quantity of sectors~~processing portion~~
includes:

codea ~~processing portion~~ for determining optical disc drive characteristics;
codea ~~processing portion~~ for collecting sector reading time data; and
codea ~~processing portion~~ for processing the collected data to provide way
sector quantity values.

35. (Currently Amended) The ~~method~~storage medium according to claim 34,
wherein the code for determining optical disc drive characteristics ~~are
determined by~~includes:

codea ~~processing portion~~ for determining cache buffer memory size of the
disc drive; and
codea ~~processing portion~~ for determining reading speed reduction
parameters of the disc drive.

36. (Currently Amended) The ~~method~~storage medium according to claim 34,
wherein the code for collecting sector reading time data ~~is collected
by~~includes:

codea ~~processing portion~~ for filling the cache buffer with blank data;
and

codea ~~processing portion~~ for collecting reading time data in a
reading time array from a defined quantity and location of ways on a disc.

37. (Currently Amended) The ~~method~~storage medium according to claim 34, wherein the code for processing the collected data ~~is processed by~~includes:

>   ~~codea processing portion~~ for filtering the data to compensate for reading errors;
>   ~~codea processing portion~~ for determining a common slope from the filtered data; and
>   ~~codea processing portion~~ for identifying slopes matching the determined common slope to ascertain individual ways for the measurement of way sector quantity values.

38. (Currently Amended) The ~~method~~storage medium according to claim 33, wherein the original disc fingerprint is provided in the form of a CD-Key.

39. (Currently Amended) The ~~method~~storage medium according to claim 36, wherein the defined location of ways is the outside edge of the trace to increase accuracy.

40. (Currently Amended) The ~~method~~storage medium according to claim 39, wherein a file is added to product data, and the ~~file of sufficient size to ensure~~ disc fingerprinting is performed at the outside edge of the disc to increase accuracy.

41. (Currently Amended) The ~~method~~storage medium according to claim 40, wherein the file is empty.

42. (Currently Amended) The ~~method~~storage medium according to claim 33, wherein the pre-defined percentage threshold value is about 70.

43. (Currently Amended) The ~~method~~storage medium according to claim 33, wherein the determined quantity of ways tested is at least about 50.

44. (Currently Amended) The ~~method~~storage medium according to claim 33, wherein product data is encrypted.

45. (Currently Amended) The ~~method~~storage medium according to claim 33, wherein a protective shell is added to product data that requests a correct CD-Key to unlock the shell for access to the product data.

46. (Currently Amended) The ~~method~~storage medium according to claim 33, wherein one or more steps are performed remotely.

47. (Currently Amended) The ~~method~~storage medium according to claim 33, wherein a recordable disc is used.

48. (Currently Amended) The ~~method~~storage medium according to claim 47, wherein the recordable disc is blank to limit the process to disc fingerprinting, enabling adding of product data at a later time.